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INTERNAL BAG BODY FOR WATER TANK  
[Mizutanku you naisou fukurotai]

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## SPECIFICATION

### 1. Title of the Invention

INTERNAL BAG BODY FOR WATER TANK

### 2. Claim

An internal bag body for a water tank characterized in that it is obtained by forming a film-shaped flexible material inside a box-type water tank, to and from which water is supplied and discharged, into a shape and external dimensions that are roughly the same as the internal dimensions of said water tank and in that it is then attached to the inside of said water tank.

### 3. Detailed Explanation of the Invention

#### [Field of Industrial Application]

The present invention pertains to water tank internal bag bodies that are installed inside water tanks that are utilized for water supply equipment and air-conditioning equipment in order to keep water stains from attaching to the inner walls of the water tanks.

#### [Related Art]

In tall office buildings and households, water tanks utilized for their water equipment and/or air-conditioning equipment are placed on the rooftops. Such water tanks are sized in accordance with the equipment and can store a few ~ 10 tons of water.

Figure 4 is a perspective drawing showing one example of a water tank.

The main unit [2] of the tank is obtained by shaping a sufficiently thick metal plate (e.g. iron plate) that can withstand water pressure

into a box-shaped container, and the joint parts are connected by means of, for example, welding so that the water filled inside will not leak.

Moreover, the upper part of the tank's main unit [2] is opened and the tank is normally used with or without a lid (not shown) on it. Moreover, a side wall of the tank's main unit [2] is provided with a release spout [3], which is for discharging the water inside the tank, and discharge spouts [4], which are for discharging the water above a specified level to the exterior. Moreover, the interior and exterior of the tank's main unit [2] have coatings on them for rust prevention.

According to a water tank having such a structure, a constant quantity of water is supplied continuously from a water supply spout [5] into the tank, or water is intermittently supplied by means of a water-supply control means (not shown), and the water is filled in a manner such that the level of water [6] does not exceed the discharge spout [4].

Incidentally, such a water tank has administrative regulations in order to secure health and safety, and periodical cleaning and inspection operations (e.g., once a year) in which water supply from the tank is discontinued in order to remove attachments (water stains, etc.) on the internal walls and suspended matters (dust, etc.) from the inside of the tank are mandated.

#### [Problems that the Invention is to Solve]

When cleaning such a water tank, the worker needs to enter the tank and manually clean it by using a cleaning tool such as a brush. Therefore, more times are required for larger tanks and the users are forced to bear the inconvenience during this time.

The purpose of the present invention was conceived in light of the above situation of the conventional technique and is to supply internal bag bodies for water tanks that allow the same cleaning operations without the need for the worker to actually enter the tank.

[Means for Solving the Problem]

In order to achieve the above purpose, with respect to box-type water tanks to and from which water is supplied and discharged, a film-shaped flexible material is formed into a shape and external dimensions that are roughly the same as the internal dimensions of said water tank and is then attached to the inside of said water tank.

[Operation of the Invention]

According to the above means, an internal bag body that is roughly equal to a water tank in terms of dimensions and shape is attached inside the water tank so that water will not contact the inner walls of the water tank. Thus, a condition that is equivalent to the water tank having a double structure is achieved. Therefore, water stains become attached to the inner surfaces of the internal bag body, and inspection and cleaning can be accomplished by simply removing this internal bag body. Therefore, the water-supply outage time can be reduced.

[Working Example]

In the following, the present invention will be explained concretely by referring to Figs. 1 ~ 3.

Figure 1 is a perspective drawing showing one working example of an internal bag body of the present invention for water tank. Figure 2 is a partial cross-sectional drawing showing the internal bag body in

the middle of installation. Figure 3 is a partial cross-sectional drawing showing the internal bag body after its installation has been finished.

As shown in Fig. 1, the main unit [11] of the internal bag body [10] has been formed into a bag by using a material that is flexible, water resistant, and unlikely to lose its shape (e.g., a polymer material, such as a synthetic resin film). Its shape and size are made to be roughly the same as the internal dimensions of the water tank it will be applied to. Moreover, at the same locations as the release part [3] and discharge parts [4] of the water tank [1], the main unit [11] is provided with a release part [12] and discharge parts [13] that can be inserted into the release spout [3] and discharge spouts [4] of the water tank [1].

The external dimensions of the internal bag body [10] are set in a manner such that, when the internal bag body is attached, it becomes tightly attached to the inner walls of the water tank [1] by the pressure of the water supplied into the water tank [1]. If the external dimensions of the internal bag body [10] are smaller than the internal dimensions of the water tank [1], there is a risk that the internal bag body [10] with an insufficient strength becomes broken by the pressure of the water inside the internal bag body [10].

Moreover, there is no risk of the internal bag body [10] being broken if  $(\text{internal dimensions of the water tank [1]}) \geq (\text{external dimensions of the internal bag body [10]})$  is true in terms of the thickness of the main unit [11] as mentioned earlier. Therefore, it suffices to provide a degree of strength by which the bag does not break while being attached to or detached from the water tank [1]. Moreover, it is desirable that the bag

be manufactured without any joints during the formation of the main unit [11] in order to keep airtightness. In reality, however, the corner parts are connected by means of thermocompression [14]. It is possible to utilize adhesive tape, etc., instead of thermocompression.

Next, the method for attaching the thus-structured bag of the working example to the water tank [1] will be explained by referring to Figs. 2 and 3. It will be assumed that the internal bag body [10] has been selected based on its size that matches the internal dimensions of the water tank [1] to which it will be attached.

When attaching the internal bag body [10] to the water tank [1], the entire internal bag body [10] is inserted into the water tank [1] and the release part [12] is positioned by being matched to the main unit [2] of the water tank [1]. Next, as shown in Fig. 2, the discharge part [12] of the internal bag body [10] is inserted into the main unit [2] of the water tank [1] and, at the same time, the discharge parts [13] of the internal bag body [10] are inserted into the discharge spouts [4]. Next, as shown in Fig. 3, the bottom and the sides of the internal bag body [10] are attached to the bottom and sides of the water tank [1].

When water is supplied into the interior bag [10], the external surfaces of the internal bag body [10] comes into contact with the inner surfaces of the water tank [1], and the condition of the water tank [1] becomes the same as one in which there is a film formation on the internal walls of the water tank [1]. Therefore, water stains that have conventionally been generated on the internal walls of the water tank [1] become generated on the inner surfaces of the internal bag body [10].

and not on the internal wall surfaces of the water tank [1].

Therefore, when it is time for regular inspection, all that needs to be done is to remove the internal bag body [10] from the water tank [1] and it becomes unnecessary to inspect and clean the water tank [1]. After removing the internal bag body [10] from the water tank [1], a new internal bag body [10] is attached to the water tank [1], and the inspection and cleaning operation is completed.

Since an internal bag body [10] is installed in this manner and the operation can be completed by simply replacing the internal bag body [10] at the time of regular inspection, etc., it becomes possible to greatly shorten the time required for the operation and the users will not be inconvenienced.

Moreover, although a water tank [1] that has a release spout [3] and discharge spouts [4] was the object in the above working example, the number and locations of the spouts vary depending on the installation conditions and the equipment, and the shape of an internal bag body [10] is also determined accordingly.

Moreover, if the water tank [1] is large, forming a bag body into the shape of a single bag increases the risk of damage. Therefore, a shape that is divided into multiple partitions (e.g., a beehive shape. The partitions should, at least partially, be connected to one another.) is preferred.

Moreover, although protrusions such as the release part [12] were simply inserted into the release spout [3] in the above working example, it is permissible to provide a fixture (e.g., washer, tightening cap,

etc.) that fixates the internal bag body [10] to the wall surfaces of the water tank [1].

Moreover, although purified water was stored in the internal bag body [10] in the above explanation, the present invention can also be applied in the same manner to fluids other than water.

Moreover, although the water tank was metallic in the above working example, the present invention can be applied to tanks made from any materials other than metals, such as synthetic resins, woods, concrete, etc.

#### [Effects of the Invention]

As explained earlier, according to the present invention, an internal bag body is formed into a shape and external dimensions that are roughly the same as the internal dimensions of a box-shaped metallic water tank, to and from which water is supplied and discharged, by using a film-shaped flexible material and is attached to the inside of said water tank. Therefore, water stains, etc., become attached to the inner surfaces of the internal bag body, and an inspection and cleaning operation is completed by simply removing the contaminated internal bag body. Therefore, the water-supply stopping time can be shortened. As a result, the users will not experience inconvenience and the operability and safety can be increased.

#### 4. Brief Explanation of the Drawings

Figure 1 is a perspective drawing showing one working example of an internal bag body of the present invention for a water tank. Figure 2 is a partial cross-sectional drawing showing an internal bag body in

the middle of being attached. Figure 3 is a partial cross-sectional drawing showing an internal bag body after its attachment has been finished. Figure 4 is a perspective drawing showing one example of a water tank.

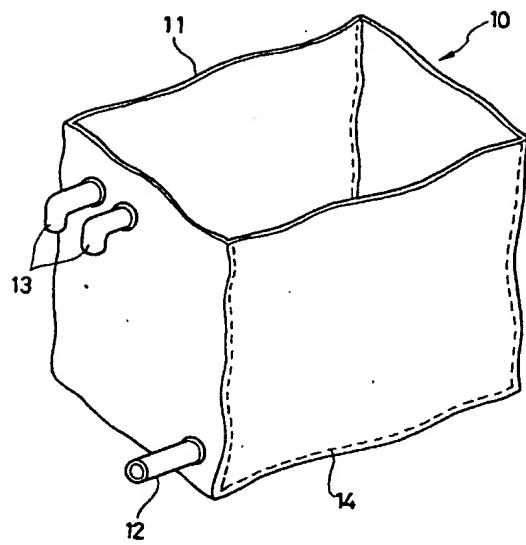


Figure 1

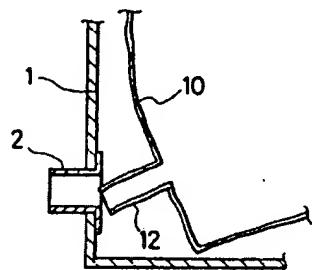


Figure 2

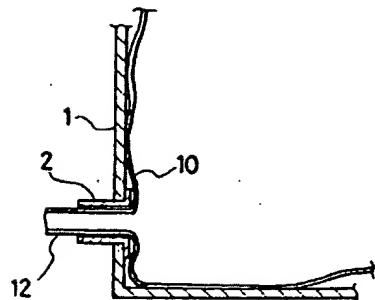


Figure 3

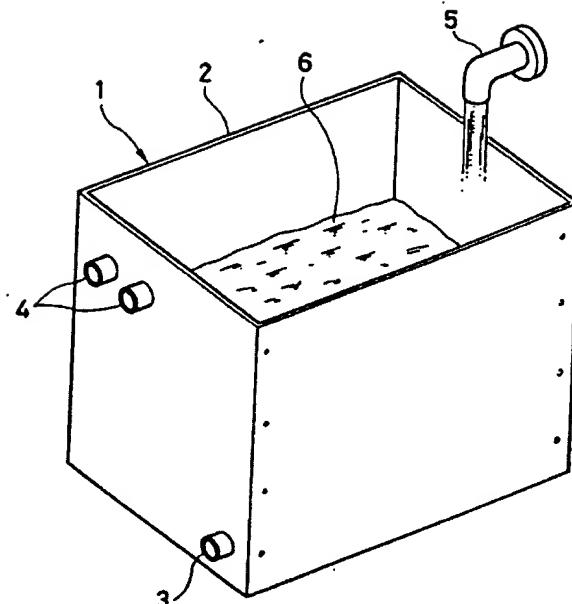


Figure 4